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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,737	01/30/2002	Po-Hao Adam Huang	510015-253	7003

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SANTA MONICA, CA 90404

EXAMINER
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LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 08/12/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/060,737

Applicant(s)

HUANG ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 8, 10-12, 14, 15 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8, 10-12, 14, 15, 17-19 and 21-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-5, 7, 8, 10-12, 14, 15 and 17-26 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment submitted on May 27, 2003 has been received and carefully considered. Claims 6, 9, 13 and 16 were cancelled. Claims 21-26 were added. Claim 20 is withdrawn from consideration. Claims 1-5, 7, 8, 10-12, 14, 15 and 17-26 remain active.

### ***Election/Restrictions***

2. In a telephone conversation with Mr. Charles Berman on February 18, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-19. However, affirmation of this election was not made by applicant in replying to the Office action (paper #7). Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)), and claim 20 has been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Objections***

3. Claims 7, 17, 18 and 25 are objected to because of the following informalities:

Regarding claim 7, it is unclear as to what applicants are attempting to recite by the amendment, "... and flow of the liquidfluid."

Regarding claims 17 and 18, the Examiner suggests inserting the term -- detecting -- or -- sensing -- before the term "efficient", for clarity in the claims.

Regarding claim 25, "characteristics" should be changed to -- characteristic --.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-5, 7, 8, 10-12, 14, 15 and 17-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, “the liquid” (line 5) lacks proper positive antecedent basis.

Regarding claim 2, it is unclear as to the relationship between “an outlet” (line 5) and “an outlet” set forth in claim 1, line 2.

Regarding claims 3-5 and 14, the language of the claims is drawn to a method limitation, rendering the claims vague and indefinite, as it is unclear as to the structural limitation applicants are attempting to recite because “the oxidizer” is not considered an element of the apparatus.

Regarding claim 11, it is unclear as to the relationship between the “chemical” and the “non-pressurized fluid” set forth in claim 1.

Regarding claims 23-25, the language of the claims is drawn to a method limitation, rendering the claims vague and indefinite, as it is unclear as to the structural limitation applicants are attempting to recite since, “the combustion of the evaporated fluid...”, “subsequent combustion...” and “the combustion...”, respectively, are not considered elements of the apparatus. Additionally, in claim 25, it is unclear as to what is intended by, “... combustion control using methods of constructive addition and destructive cancellation of the acoustic wave,” and where it is disclosed in the specification.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5, 8, 10-12, 14, 17-19 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masel et al. (U.S. 6,193,501).

Regarding claim 1, Masel et al. (FIG. 2) disclose a device **10** comprising walls forming a chamber **16** having an outlet **28, 31** (column 3, lines 4-24); a pre-heat section **24** (column 5, lines 56-67) adjacent to the chamber **16** for pre-heating a fuel and introducing the pre-heated fuel into the chamber **16**; a fuel feed path **22** (FIG. 3; column 5, lines 42-47) for supplying fuel to pre-heat section **24**; and an initiator **44** (column 6, lines 17-26) for igniting the pre-heated fuel. Although Masel et al. does not call the pre-heat section **24** an “evaporator”, Masel et al. further disclose that pre-heat section **24** functions to raise the temperature of the fuel from ambient to the initiation temperature (column 5, lines 56-66). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate temperature

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for the pre-heat section, such that a given fuel was evaporated, in the apparatus of Masel et al., on the basis of suitability for the intended use and absent showing any unexpected results thereof, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233. In view of the newly added limitations, applicants recite that the fuel comprises, "a non-pressurized fluid". However, the apparatus of Masel et al. still meets the claim, since the specific fuel utilized is a recitation of intended use. The intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

Regarding claim 2, Masel et al. disclose an inlet **20** (FIG. 2, 3) for introducing oxidizer into chamber **16**, wherein initiator **44** provides energy to combust the mixture of fuel and oxidizer (column 6, lines 17-26). In view of the newly added limitation, applicants recite the oxidizer comprises "a non-pressurized oxidizer". However, the apparatus of Masel et al. still meets the claim, since the specific oxidizer utilized is a recitation of intended use. The intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

Regarding claims 3-4, Masel et al. disclose the oxidizer is a gas, such as oxygen (column 3, lines 8-12), introduced to the chamber **16** through inlet **20**. Although Masel et al. are silent as to whether the oxidizer may comprise specifically "ambient air", the apparatus still meets the claims, as no further structural limitations are recited since "the oxidizer" is not an element of the apparatus but a recitation of intended use. Additionally, the apparatus of Masel et al. is capable of supplying a gaseous oxidizer, and is therefore inherently capable of supplying ambient air.

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Regarding claim 5, no further structural limitations are recited since the language of the claim is drawn to a method limitation, and therefore the apparatus of Masel et al. meets the claim. In any event, Masel et al. disclose, “the mixed vapor of fuel and oxidizer is heated, initiating the oxidation reaction to begin before the vapor enters the catalytic combustor region...” (column 6, lines 19-23), which reads on the recited method limitation.

Regarding claim 8, although Masel et al. illustrate a single channel for feed path **22** (FIG. 2; column 2, line 65 - column 3, line 3), it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an additional channel to the apparatus of Masel et al., since the duplication of part was held to have been obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960).

Regarding claim 10, Masel et al. further disclose the device may be made from materials selected according to operating temperature, such as silicon (i.e. silicon carbon or similar suitable materials; column 3, lines 45-59; column 5, lines 9-35), or silicon and ceramic (i.e. alumina) thin film based quality materials (column 4, lines 5 - column 5, line 35).

With respect to claim 11, Masel et al. disclose evaporator/pre-heat section **24** located substantially adjacent to and gaseously connected to chamber **16** (FIG. 2; column 3, lines 4-24).

Regarding claims 12 and 14, although Masel et al. only illustrate a single fuel inlet **22**, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an additional inlet to the apparatus of Masel et al., on the basis of suitability for the intended use, since the provision of plural inlets to an apparatus is well known in the art, and the duplication of part was held to have been obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960). Also, the

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recited limitations for the oxidizer do not patentably distinguish over the reference, since the oxidizer is not considered an element of the apparatus.

Regarding claims 17 and 18, although Masel et al. are silent as to the apparatus comprising at least one temperature or pressure sensor, such sensors are inherent of the apparatus of Masel et al., as evidenced by the disclosure. For example, Masel et al. recite, “the exhaust nozzle **28** design is determined by *pressure required* within the microcombustor **10** and the *temperature required* for output to a heat engine,” (column 6, lines 52-57).

Regarding claims 19 and 26, Masel et al. further disclose device **10** comprises no valves, chemical pumps, pressurized chemical lines or pumps (i.e., by virtue of the channeled substrate design; FIG. 2, 3), and thus no moving mechanical parts.

Regarding claim 23-25, the apparatus of Masel et al. meets the claims, since no further structural limitations are recited and “the combustion”, “an acoustic wave” and “a pulsating wave” are not considered an element of the apparatus. In any event, Masel et al. further disclose, “power outlet **31** directs force from combustion outward from the combustion chamber. The dispelled force may be converted to useful energy by any suitable means.” (column 3, lines 13-24). Therefore, a specific wave characteristic may be generated by the force of combustion, depending on the intended use of the apparatus.

6. Claims 7, 15, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masel et al. (U.S. 6,193,501) in view of Forster et al. (U.S. 4,376,627).

Regarding claims 7 and 21, Masel et al. are silent as to pre-heat zone/evaporator **24** comprising a membranous pad containing a plurality of holes and grooves. Forster et al. teach a combustion apparatus comprising an evaporator having partition walls **7** constituted of porous



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ceramic material permeable to liquid fuel (column 5, lines 37-49; column 3, lines 16-41), substantially similar to the recited membranous pad. It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide a membranous pad to the apparatus of Masel et al. because the pad improves the mixing of fuel since, "liquid fuel penetrates the porous partition and spreads thinly upon the surfaces turned toward the oxidizing-agent stream... [and] in effect, the oxidizing agent and a fuel gas are mixed well upstream," as taught by Forster et al.

Regarding claim 15, Masel et al. disclose initiator **44** comprises a strip of platinum (column 6, lines 17-26), wherein an electrical current is passed to the strip to ignite the fuel. In view of the newly added limitation, Masel et al. is silent as to whether the initiator may comprise specifically "at least one of a spark or glow wire to provide combustion." In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such an initiator for the apparatus of Masel et al., on the basis of suitability for the intended use, since such initiators are conventionally known in the art, as evidenced by Forster et al. (i.e., igniting wire 13; FIG. 1; column 5, line 64 to column 6, line 6). Additionally, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claim 22, Masel et al. disclose, "contemplated is a device without a mixer cavity where the fuel and oxidant mix through diffusion in the chamber," (column 6, lines 14-16), which indicates the pre-heat zone/evaporator **24** is capable of delivering the chemical in a non-pressurized state to the combustion chamber **16**.

***Response to Arguments***

7. Applicant's arguments with respect to the rejection of the claims over Wegeng (U.S. 5,811,062) have been fully considered and are persuasive. Therefore, said rejections have been withdrawn.

8. Applicant's arguments with respect to the rejection of the claims over Masel et al. (U.S. 6,193,501) have been fully considered but they are not persuasive. Applicants assert (page 6, first paragraph),

Nowhere does the '501 patent teach, disclose, or suggest the use of non-pressurized fluids by the evaporator for the combustion process."

In response to applicant's argument, the Examiner submits that although the apparatus of Masel et al. may not disclose the utilization of "non-pressurized fluids" for the combustion process, the apparatus of Masel et al. still structurally meets the claims, since the specific fluid utilized by the apparatus is a recitation of intended use, which holds no patentable weight in apparatus claims. Note that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

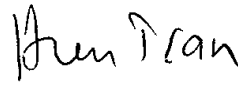
\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung  
August 10, 2003 

  
**HIEN TRAN**  
**PRIMARY EXAMINER**